

REMARKS

New claim 46 corresponds to original claim 16, amended to recite that the ceramic has a BET surface area of at least 200 m²/g. This amendment is supported by the specification, at page 10, lines 16-17; at page 11, lines 1-2; at page 15, lines 1-4 and 25-27; and in Figures 6-8.

New claims 47 and 48 correspond to original claims 17 and 18. New claim 49 corresponds to claim 19, which was cancelled in the Amendment and Request for Reconsideration filed July 29, 2008. New claims 50 and 51 correspond to original claims 20 and 21. New claims 52, 53, and 54 correspond to claims 36, 37, and 44, which were cancelled in the Amendment and Request for Reconsideration filed July 29, 2008.

No new matter has been added. Claims 28-31, 33, 34, and 45-54 are present and active in the application.

Request for Reconsideration

Activated carbon does not resist temperatures higher than 573 K in an oxidative atmosphere. Therefore, it had been thought to be inapplicable to use activated carbon as a substrate fiber for fabrication processes requiring high temperature calcination, such as the manufacturing of ceramic coated fibers. The present invention is based on the discovery that, despite this instability at high temperatures, activated carbon can be used as a template in the formation of ceramic coated fibers.

The activated carbon coated fibers are infiltrated with ceramic precursors by immersion in a solution of one or more ceramic precursors in a volatile solvent. The excess precursor is removed, and the infiltrated precursor may be hydrolyzed by exposure to the moisture in the air, yielding a composite of carbon and the precursor or the hydrolyzed precursor.

The system is then subjected to a heat treatment, which may remove residual solvent, cure the precursor, as well as remove the activated carbon,

and crystallize the ceramic. The carbon substrate may also be oxidized by irradiation of the fibers, or by treatment with chemical oxidizers.

Previously Cited References

Applicants submit that new claims 46-54 are novel over previously cited reference Nam et al. ("Preparation and characterization of TiO₂ fiber and its photocatalytic properties", Paper # 291). Independent claim 46 recites that the ceramic has a BET surface area of at least 200 m²/g. By contrast, Nam et al. is silent as to the BET surface area of the fibers it discloses (Table 2, page 12). Accordingly, Nam et al. is neither anticipatory of the claimed invention, nor does it render the claimed invention obvious.

Kim et al. ("Preparation of TiO₂ Fiber and its Photocatalytic Properties", Materials Science Forum, vol. 439, pp. 271-276 (2003)) is not available as prior art against the present application. The date on which Kim et al. is available as prior art under 35 U.S.C. §102(a) is November 15, 2003, namely, the date on which Kim et al. was published online. Accordingly, November 15, 2003 is the effective date of Kim et al. The constructive reduction to practice date of the present invention occurred on March 10, 2004, the filing date for the present application. Filed herewith is an executed Declaration under 37 C.F.R. 1.131. This Declaration asserts a date of conception of the present application prior to the effective date of Kim et al., coupled with due diligence from just prior to said effective date until the constructive reduction to practice of the present invention. Since the present application was invented before the effective date of Kim et al., Kim et al. is not available as prior art against the present application.

Rejection under 35 U.S.C. § 103

The rejection of claims 28-31, 33-34, and 45 under 35 U.S.C. § 103(a) over Cai et al. (U.S. Pat. No. 6,680,279) in view of Thierauf '397 (U.S. 2006/0099397), Thierauf '712 (U.S. 2006/0078712) is respectfully traversed. Thierauf '397 and Thierauf '712 are not available as prior art against the present application.

Thierauf '397 claims priority to International Application No. PCT/DE03/01741, published as WO 03/101912 ("WO '912"). Thierauf '712 claims priority to International Application No. PCT/DE03/01743, published as WO 03/101913 ("WO '913"). WO '912 and WO '913, however, were not published in the English language. Accordingly, Thierauf '397 and Thierauf '712 are not available as prior art under 35 U.S.C. § 102(e).

The date on which Thierauf '397 and Thierauf '712 are available as prior art under 35 U.S.C. §102(a) is December 11, 2003, namely, the date on which WO '912 and WO '913 were published. Accordingly, December 11, 2003 is the effective date of Thierauf '397 and Thierauf '712.

The filed herewith Declaration under 37 C.F.R. 1.131 asserts a date of conception of the present application prior to the effective date of Thierauf '397 and Thierauf '712, coupled with due diligence from just prior to said effective date until the constructive reduction to practice date of the present invention. Since the present application was invented before the effective date of Thierauf '397 and Thierauf '712, Thierauf '397 and Thierauf '712 are not available as prior art against the present application.

As Cai et al., alone is insufficient to support a rejection under 35 U.S.C. § 103(a), withdrawal of this ground of rejection is respectfully requested.

The rejection of claims 28-31, 33-34, and 45 under 35 U.S.C. § 103(a) over Cai et al. (U.S. Pat. No. 6,680,279) in view of Sowards et al. (U.S. Pat. No. 3,518,206) is respectfully traversed. The references are silent as regards ceramic coated fibers. Furthermore, the process of Cai et al. is incompatible with that of Sowards et al.

Cai et al. discloses a method of dispersing nanosized catalyst particles on the surface of larger carrier particles (abstract). Nanometer-sized particles of catalytic noble metals, such as platinum, are dispersed, or coated, on the surfaces of larger carrier particles. The carrier particles are preferably of alumina or alumina that incorporates metal oxides (col. 2, lines 17-33). The coating process is a dry mixing process, not requiring the use of water or any other constituent to accomplish the coating of the catalyst particles on the carrier

particles (col. 2, lines 56-57). The product catalyst particle/carrier particle is in the form of a powder (col. 2, lines 66-67). The powder can be coated on support structures such as ceramic fibers or carbon fibers (col. 3, lines 4-6). Specifically, Examples 2 and 3 (col. 6, line 53 to col. 10, line 50) describe the coating of ceramic fibers with alumina particles. The reference is, however, silent as to whether the ceramic fibers are ceramic coated fibers. Also, Cai et al. does not disclose the BET surface area of the fibers. Rather, only the average diameter and average length of the fibers are disclosed (col. 6, lines 59-60; col. 8, lines 39-40).

Sowards et al. discloses the coating of substrates or supports with colloidal amorphous silica (abstract). A suitable silica sol is prepared with silica spherulites having an average diameter of about 5 to 150 μm (col. 4, lines 37-63). The support is then coated with the silica sol by immersion, spraying, and the like. The support is drained and dried, and the process is repeated until the desired thickness of coating is obtained (col. 4, lines 69-75). Catalytic materials can be added to the coating (col. 5, lines 3-16). The surface of the coating can be as high as 200 m^2/g by using a large proportion of colloidal silica (col. 7, lines 60-69). Sowards et al. is however silent as regards ceramic coated fibers.

Cai et al. and Sowards et al. neither disclose nor suggest ceramic coated fibers. Furthermore, Cai et al. is so distinct from Sowards et al. as to render the two references incompatible. In particular, Cai et al. discloses a process for the production of particles, specifically alumina particles coated with nanometer-sized catalyst particles. In addition, the process of Cai et al. is a dry mixing process. By contrast, Sowards et al. discloses colloidal silica coatings obtained by a sol process, *i.e.* a process involving a suspension of particles in a solvent. The references therefore disclose different processes suited to the production of different types of materials.

Accordingly, not only do the references not disclose or suggest ceramic coated fibers, but they are also so dissimilar as to be incompatible. Removal of this ground of rejection is thus respectfully requested.

CONCLUSION

All of the grounds raised in the present Office Action for rejecting the application are believed to be overcome or rendered moot based on the remarks above. Thus, it is respectfully submitted that all of the presently presented claims are in form for allowance, and such action is requested. Should the Examiner feel a discussion would expedite the prosecution of this application, the Examiner is kindly invited to contact the undersigned at (312) 876-1400.

Respectfully submitted,



Evan Law Group LLC
600 West Jackson Blvd., Suite 625
Chicago, IL 60661
(312) 876-1400

W. John Keyes, Ph.D.
Registration No. 54,218